

# ESU 009– Dietary fibers as functional foods

## Lecture 18



# Fiber

The term “FIBER” refers to carbohydrates that cannot be digested.

Fiber is only found in foods that comes from plants and vegetables.

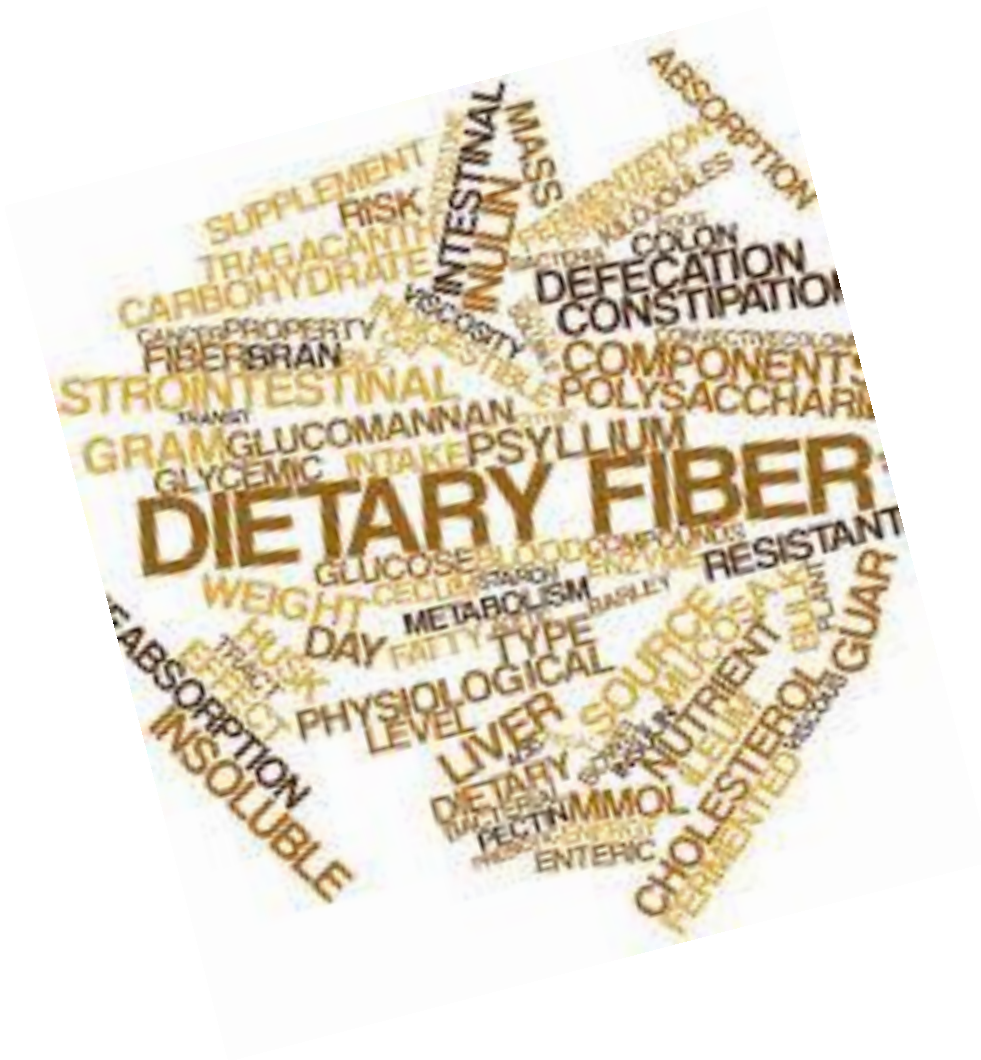
## ○ Types of Fiber

○ Two types of fibers :

1. Soluble Fiber
2. Insoluble Fiber

Soluble fiber is one that partially dissolves in water and has been shown to lower cholesterol.

Insoluble fiber doesn't dissolve in water and that is why it helps with constipation.



# DIETARY FIBRE

- **Structural carbohydrate of plants**
- **Neither digested nor absorbed**
- **Insoluble fibers - Predominant**
  - **Absorbs water in gastrointestinal tract**
  - **Promotes regular elimination**
  - **Increases stool weight**
  - **Speeds up digestion/elimination time**
- **Soluble fibers - Health benefits**
  - **Lowers serum cholesterol**
  - **Regulates blood sugar levels**



# Intake of Dietary Fiber



- **Increased fiber intake may reduce risk of:**
  - **Gastrointestinal diseases**
  - **Hypertension**
  - **Diabetes**
  - **Heart disease**
  - **Several types of cancer (Colon)**
- **Recommended: 20-35 g daily**
- **Best sources:** fruit, vegetables, whole grain breads/cereals, beans, rice, nuts, seeds.
- Adequate water intake is important.



## Characteristics of Soluble and Insoluble Fiber

### Soluble Fiber

Slows digestion and assists the body in absorbing vital nutrients from foods

Dissolves in the water found in the large intestine and forms a gel

Can aid in lowering total cholesterol levels and low-density lipoprotein cholesterol levels, as well as improve glycemic index in patients with diabetes

Examples of foods high in soluble fiber include oat and rice bran, barley, peas, beans, apple pulp, citrus fruits, strawberries, and psyllium husk

### Insoluble Fiber

Does not dissolve in water, but increases the movement of waste through the intestinal tract

Has been associated with decreased cardiovascular risk and slower progression of cardiovascular disease, particularly in high-risk individuals

Prevents constipation and may also aid in removing toxic waste in the colon

Examples of foods high in insoluble fiber include wheat bran, whole grains, rice, flax seed, nuts, popcorn, cabbage, beets, carrots, Brussels sprouts, turnips, cauliflower, and apple skin as well as other fruits and vegetables with skins

## Insoluble Fiber

### ▪ Functions of Insoluble Fiber

- move bulk through the intestines
- control and balance the pH (acidity) in the intestines

### ▪ Benefits of Insoluble Fiber

- promote regular bowel movement and prevent **constipation**
- remove toxic waste through colon in less time
- help prevent colon cancer by keeping an optimal pH in intestines to prevent microbes from producing cancerous substances

### ▪ Food Sources of Insoluble Fiber

- Vegetables such as green beans and dark green leafy vegetables
- Fruit skins and root vegetable skins
- Whole-wheat products
- Wheat bran
- Corn bran
- Seeds & Nuts



# Foods Rich in Fiber

## HIGH FIBER FOODS

strongwomensthoughts ♥ tumblr

♥ Avocado



♥ Seeds



♥ Bananas



♥ Oats



♥ Blueberries



♥ Apples with skin



♥ Soybeans



♥ Nuts



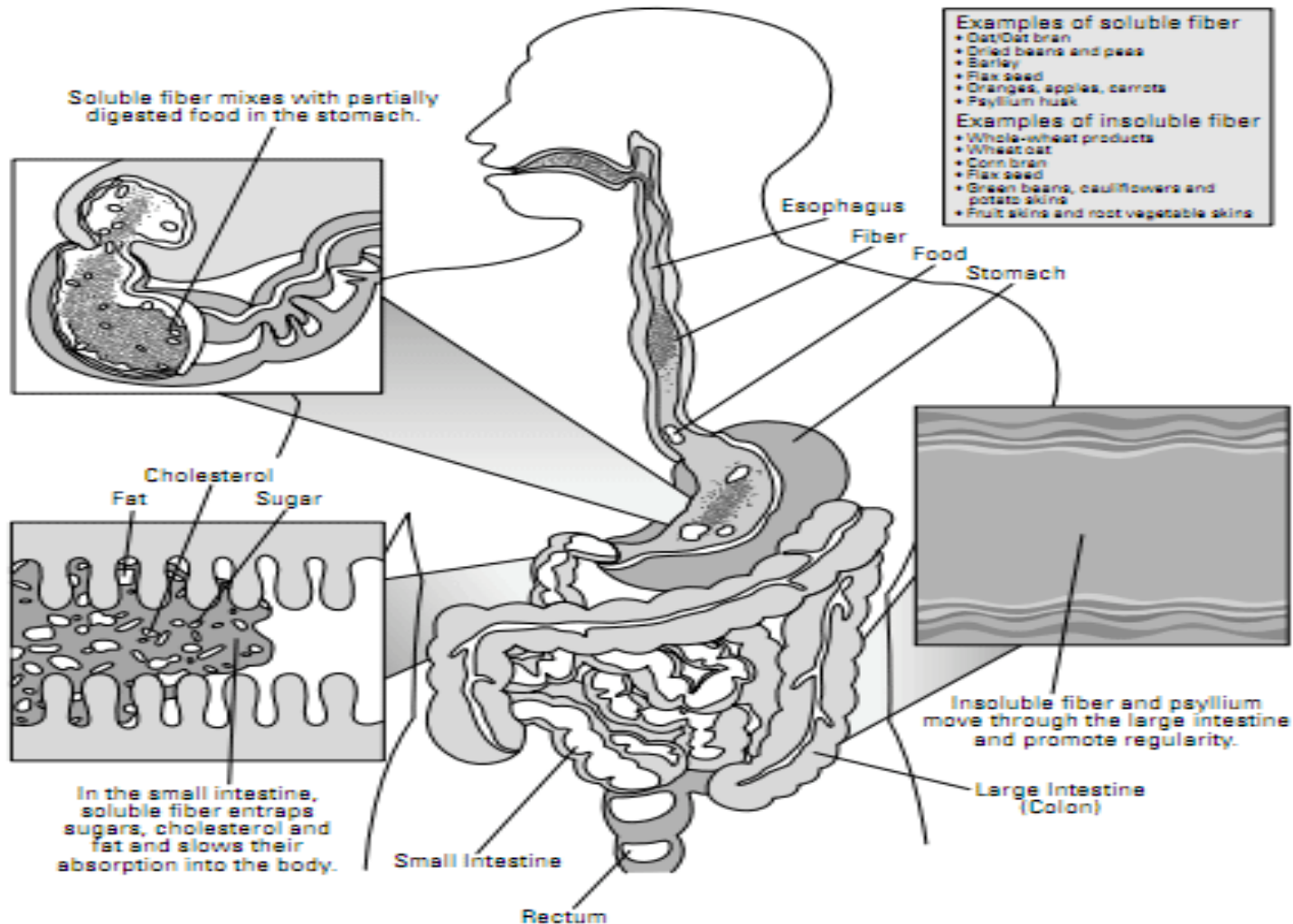
♥ Sweet Corn

Fiber makes us feel full sooner and stays in our stomach longer than other substances we eat. Adding more fiber to your diet will help you lose weight and improve your health!

# How Fiber Works

## Soluble and Insoluble

After soluble fiber is ingested, it absorbs water and turns into a gel-like substance which entraps food, sugars, cholesterol and fats in the stomach and carries them through the digestive tract. Insoluble fiber passes through the system largely intact.





- Diet in childhood and adolescence influence not only health of child but also the future health of adult
- Therefore optimal diet during these formative years must be adequate to support the normal growth and development during childhood as well as to establish nutritional foundation for prevention of diet related chronic diseases among adults.

# HEALTH BENEFITS OF



# DIETARY FIBRES

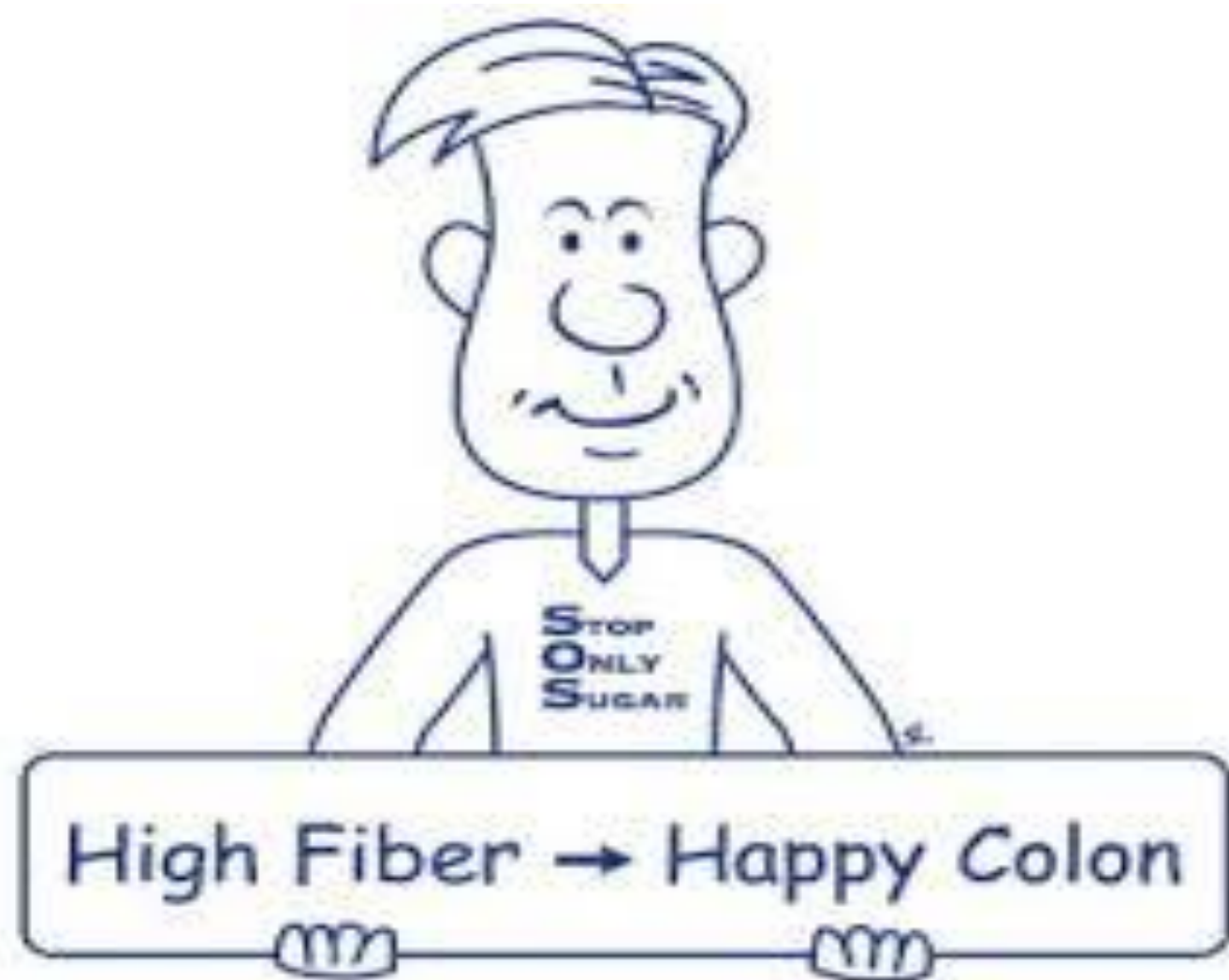
## Physiological properties of dietary fibres

(The European commission directive 2008/100/EC, European Union, 2008).

- Decrease intestinal transit time;
- Increase stool bulk;
- fermentable by colonic microflora;
- reduce blood total cholesterol;
- reduce blood LDL cholesterol levels;
- reduce post-prandial blood glucose, reduce blood insulin levels.

- Speeds up digestion
- Eliminates cancer compounds from the body
- Changes the bacteria in the gut to good bacteria
- Getting enough fiber can reduce the risk of:
  - Colorectal cancer
  - Breast cancer
  - Some head/neck cancers





# Thank you

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